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10/617,729	07/14/2003	Gerard Forat	022701-830.001	3601

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EXAMINER

VOLLANO, JEAN F

ART UNIT	PAPER NUMBER
1621	

DATE MAILED: 04/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/617,729

**Applicant(s)**

FORAT, GERARD

**Examiner**

Jean F. Vollano

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 19-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 19-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☒ Certified copies of the priority documents have been received in Application No. 09/319,967.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |  |
|---|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/23/2003</u> . | 6) <input type="checkbox"/> Other: ____  |

## **DETAILED ACTION**

### ***Priority***

1. It is noted that this application appears to claim subject matter disclosed in prior Application No. 09/319967, filed 9/9/1999. A reference to the prior application must be inserted as the first sentence of the specification of this application or in an application data sheet (37 CFR 1.76), if applicant intends to rely on the filing date of the prior application under 35 U.S.C. 119(e) or 120. See 37 CFR 1.78(a). For benefit claims under 35 U.S.C. 120, the reference must include the relationship (i.e., continuation, divisional, or continuation-in-part) of all nonprovisional applications. Also, the current status of all nonprovisional parent applications referenced should be included (e.g. abandoned).

If the application is a utility or plant application filed under 35 U.S.C. 111(a) on or after November 29, 2000, the specific reference to the prior application must be submitted during the pendency of the application and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior application. If the application is a utility or plant application which entered the national stage from an international application filed on or after November 29, 2000, after compliance with 35 U.S.C. 371, the specific reference must be submitted during the pendency of the application and within the later of four months from the date on which the national stage commenced under 35 U.S.C. 371(b) or (f) or sixteen months from the filing date of the prior application. See 37 CFR 1.78(a)(2)(ii) and (a)(5)(ii). This time period is not extendable and a failure to submit the reference required by 35 U.S.C. 119(e) and/or 120, where applicable, within this time period is considered a waiver of any

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benefit of such prior application(s) under 35 U.S.C. 119(e), 120, 121 and 365(c). A priority claim filed after the required time period may be accepted if it is accompanied by a grantable petition to accept an unintentionally delayed claim for priority under 35 U.S.C. 119(e), 120, 121 and 365(c). The petition must be accompanied by (1) the reference required by 35 U.S.C. 120 or 119(e) and 37 CFR 1.78(a)(2) or (a)(5) to the prior application (unless previously submitted), (2) a surcharge under 37 CFR 1.17(t), and (3) a statement that the entire delay between the date the claim was due under 37 CFR 1.78(a)(2) or (a)(5) and the date the claim was filed was unintentional. The Director may require additional information where there is a question whether the delay was unintentional. The petition should be addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

### *Specification*

2. The disclosure is objected to because of the following informalities: There are pages in the specification wherein a letter or two is missing from the words. For example on page 2 line 2 the word “m ans” should be –means--. On page 3 in the first line the word “solv nt” is missing an e and on the next line the word “th ” and the word “v ry” are both missing an e. An e is miss from “b” in line 1, page 4. on page an e is missin from “r sidue”. There could be more and applicant is ask to review the specification and make appropriate corrections. Another example that confused the examiner when it was read is on page 7 wherein “the white precipitate form d is filtered off”. The examiner originally tried to figure out why the form of one isomer was d since the structure didn’t seem to be a d or l form. It appears now that the e is missing and it should read the white precipitate formed is filtered off.

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Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

3. Claims 19-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 19 recites the limitation of silylating and “acyl amide”. An amide is a  $R-C(O)NR_2$  group and an acyl amide would then be a  $RC(O)C(O)NR_2$  since an acyl group is  $RC=O$ . The specification does not seem to have these types of diacyl compounds. Also the dependent claim 31 has a product structure with only one acyl group. Therefore the claim is confusing as to the metes and bounds that are being claimed.

Claim 19 recites the limitation of “subjecting an amide bearing group  $R_f$ (perfluoroalkyl) to a trialkylsilyl halide”. First of all it is unclear what is meant by subjecting? Does that mean reacting or does that mean that the amide is placed near the silyl compound and the vapors of the compound subject the amide to an interaction? The term is confusing. If there is a reaction then this should be clearly stated. If this is not the case please clarify. The limitation of an amide bearing group  $R_f$ (perfluoroalkyl) is also confusing as to what is being claimed. Does bearing mean that there is an ionic or hydrogen bonding interaction between the amide and a perfluoroalkyl group and that is how the amide bears the group? Or is the group a perfluoroalkyl amide? The way the wording is this also seems to mean only one perfluoroalkyl group is on the amide if this is the case is the group on the nitrogen portion as  $(-N(H)(\text{perfluoroalkyl}))$  or is the perfluoroalkyl on the carbonyl portion as  $(\text{perfluoroalkyl}-C(O))$ .

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Also what are the other groups on the amide? Are they always hydrogen or is there an alkyl group or are they all perfluoroalkyl groups? The process appears to be a reaction between two reagents if the amide is not defined then it is unclear what exactly is being prepared and how it is being prepared. This part of the rejection can be overcome by placing the structure of the amide in the claim so that the metes and bounds of the reaction can be determined.

Claim 19 recites the limitation of “in the presence of a base whose carbon number is not more than about 10 and whose halide, or hydrohalide, is insoluble”. First of all it is unclear how a compound can have a carbon number not more than ABOUT 10. A compound does not have parts of carbon. It has whole numbers of carbon atoms unless it is a polymer mixture or a mixture of any sort? Therefore it is unclear what the word about is trying to signify. Does it not more than 9 or does it mean not more than 10? The term is confusing. Also the limitation does not require carbon in the base. It states that the carbon number is not more than 10 which means it can be 0. So is the claim to inorganic and organic bases? NaOH has a carbon number not more than 10. Dimethyl amine or ethyl amine is a base with a carbon number not more than 10. Also some acids can be bases in certain solvents where the solvent is more acidic than the acid. The metes and bounds of the base are confusing and unclear. The next limitation is “whose halide or hydrohalide is insoluble”. What halide? If the base is an amine then the halide is clear but what is the hydrohalide or Na OH or another type of base? The metes and bounds of this process limitation are confusing at best and definitely vague and indefinite. The same problems occur in claim 35.

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Claim 20 recites the limitation of “solubility therein of only 1% at most”. The 1% is not in reference to a comparison unit. Is it 1% by weight? 1% by volume? 1% by molar amount? The claim is confusing as to the metes and bounds of what is being claimed in the instant invention.

Claim 21 recites the limitation of “the reaction mixture fully dissolves the silylamide”. There is no silylamide mentioned in claim 20 and therefore the claim lacks antecedent basis. Also is it a silylamide that is being produced or a perfluoroalkyl moiety? It is also noted that the independent claim states “bis silylating” so is it a perfluoro alkyl bis silyl amide? There is also no reaction mixture mentioned in claim 19. Usually it would be all the additives including the reagents the solvents and any catalyst etc. However since the word mixture is found in claim 19 it would be clearer if the reaction mixture were defined.

Claim 27 recites the limitation of wherein “the base is a pnictine selected from the group consisting of a hydrocarbon-based trivalent element from column VB ... and a hydrocarbon based element from column V of the Periodic table.”

This is confusing as written to what are the metes and bounds of the term hydrocarbon based. Are organometallic compounds included since there are phosphorus organometallic compounds which have hydrocarbons and phosphorus and are basic? Are porphines which are basic and contain heterocyclic trivalent nitrogen bases as part of the structure? Or does the structure have to have a hydrocarbon? The term hydrocarbon based can be view as compounds which had their origin in a hydrocarbon but final product is devoid of hydrocarbons? The claim language is confusing as to the metes and bounds of what is being claimed as the instant invention. Also the term pnictines seems to be included in the confusing terms of VB since pnictines seemingly include phosphorus and nitrogen bases. The claim is confusing and should

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be rewritten in a clear and concise manner pointing out the metes and bounds of the instant invention. Also the term "pnictine" seems to be trying to include nitrogen etc while the accepted meaning is "phosphorus, arsenic, antimony and bismuth moieties. The term is not found in Hawley's Chemical dictionary and an on line search found only two hits in chem. Abstracts. The examiner has always used the term to describe group V moieties beginning with phosphorus and going through the family to bismuth. This is consistent with the report on pnictines found on -line (CA:2000:330785). Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term is indefinite because the specification does not clearly redefine the term.

Claim 28 recites the limitation of "base which has not more than about 10 carbon atoms per basic function. First of all the term function is confusing as to what is being claimed. Does this relate to the function of the base as to the basicity? Or does it relate to the function of assisting the reaction? The term is confusing as to what is being claimed. Also again the ABOUT 10 carbon atoms is confusing (see above in the rejections of claim 19 for an explanation of the problem). Also the claim seems to state that 10 carbon atoms per basic function if there are two functions that could mean 20 carbon atoms. This is not what is found in the independent claim which claims a total of 10 carbon atoms for the base. The same problems occur in claim 29.



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Claim 31 recites a  $\text{NH}(2-x)$  and an  $[\text{Si R}_1\text{R}_2\text{R}_3]_x$ . However the independent claim recites a bis silylation reaction and that would make  $x = 0$  in all instances. Now there seems to be a dependent claim that is reciting a mono or bis silylation.

Claim 31 has an EWG moiety which is recited as being “an electron-withdrawing group whose functions, if any, are inert under the reaction conditions” First of all the  $\text{R}_f$  was defined in the independent claim as a perfluoroalkyl group. By definition a perfluoroalkyl group is an alkyl group where all the hydrogens are replaced by fluorines. In a perfluoroalkyl group the terminal portion is  $\text{CF}_3$  not  $\text{CF}_2$  with some other electron withdrawing group whose may or may not have a function. It is also unclear what the metes and bounds of this group could possibly be since the definition is so vague and indefinite.

Claim 34 recites the limitation of “wherein the silylation is a disilylation and occurs in the absence of hexamethyldisilazane”. This is confusing if the reaction is a silylation then how can it be a de silylation? The two are the opposites. And what is being desilylated? Or does the disilylation refer to the bis silylation in the independent claim and the claim is trying to say that the silylation is a bis silylation? However claim 1 already has a bis silylation so this claim does not further limit the silylation part of the claim.

The claims are so confusing and convoluted as written that it would be almost impossible to cite all the problems since there are so many. The claims are replete with 112, 2 problems. The above are some samples of those problems. Applicant is asked to review the claims for additional problems and make the appropriate corrections.

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***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 19-32, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klebe (US3397220) in view of Kotzsch et al (US4647681).

Klebe teaches the preparation of bis trialkylsilyl amides among other products by the reaction of trimethylchlorosilane and acetamide in the presence of the base triethyl amine (see example 2.

Although Klebe does not use a solvent in example 2, Klebe , expressly suggest that solvents can be used which include non polar compounds such as carbon tetrachloride, tetrachloroethane and benzene ( hydrocarbon solvent) in a small list of solvents given ( column 5, lines 24-31).

Klebe is silent as to the use of fluorinated amides in the process.

Kotzsch et al in a similar process for preparing bis trialkylsilyl amides teaches that both the non fluorinated alkyl and the fluorinated alkyl amide can be used in the silylation process since both are able to be silylated. Kotzsch teaches that one of the alkyl groups can be trifluoroacetic acid which would be the amide starting material ( see column 1, line 24)and teaches a product which would be a bis silyl product (see column 1, formula II).

It would have been obvious to one ordinary skill to have used the process of Klebe with a non polar solvent selected from the small group given. The motivation to use a non polar solvent

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solvent would be to keep the triethyl amine hydrochloride by-product ( which is ionic) from dissolving in the solvent and thus being able to remove more by-product by filtration. It would have also been obvious to one of ordinary skill to use a fluoroalkyl amide in the process since Kotsch teaches that ether the fluorinate or non fluorinate alkyl amide will work in the silylation process.

5. Claims 19-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mawhinney et al (US 4,469,794) in view of Shinohara et al (US 4,663,471) or alternatively in view of Chem abs 694 (CA:76:59694).

Mawhinney et al teach a process for the preparation for silylating an acylamide which has a perfluorolower alkyl group (see abstract) and a trialkyl silyl chloride ( see column 2 lines 32-35) in the presence of a base whose carbon number is not more than about 10 ( e.g. pyridine, trimethylamine, triethylamine, N-methylmorpholine etc).

Mawhinney et al differs in that the solvent used is not a hydrocarbon solvent but a polar solvent.

Shinohara in a different process for preparing silylacetamides gives an introductory generic teaching that the conventional method for preparing trialkylsilyl trifluoroacetamide by the reaction of a trialkylchlorosilane can be performed in a solvent which includes benzene and the aliphatic hydrocarbon hexane. Shinohara is used exclusively to show the generic teaching of what the conventional method and solvents for preparing trialkylsilyl trifluoroacetamide was known to one of ordinary skill in the art.

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Chem abs 694 teaches in a different process for the preparation of a trialkylsilyl trifluoroacetamide that a pentane solvent is usable in a reaction that gives a trialkylsilyltrifluoroacetamide product. Again this reference is used solely to show the generic teaching that the product being prepared is stable in a pentane or aliphatic hydrocarbon solution and could be used as a solvent for the process of Mawhinney.

It would have been obvious to one ordinary skill to have used the process of Mawhinney using any known solvent for the process or any known solvent in which the product and the reactant was with a non polar solvent being selected as taught by Shinohara et al or alternatively by Chem abs 694. The motivation to use a non polar solvent (e.g. benzene, pentane, hexane etc) would be to keep the amine hydrochloride by-product (which is ionic) from dissolving in the solvent and thus being able to remove more by filtration and causing the product to be purer since the salt by-product is a contaminant. It is not an unobvious modification to use any known solvent (i.e. change known solvents) for a known process such as Mawhinney barring unexpected results by the use of the solvent.

6. Claims 19-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klebe (US3397220) in view of Shinohara et al (US 4,663,471) and in view of Mawhinney et al (US 4,469,794).

Klebe teaches the preparation of bis trialkylsilyl amides among other products by the reaction of trimethylchlorosilane and acetamide in the presence of the base triethyl amine (see example 2).

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Although Klebe does not use a solvent in example 2, Klebe , expressly suggest that solvents can be used which include non polar compounds such as carbon tetrachloride, tetrachloroethane and benzene ( column 5, lines 24-31). The term “such as” shows that the list is not exhaustive and suggests any non polar solvent.

Klebe is silent as to the use of fluorinated amides in the process.

Shinohara in a different process for preparing silylacetamides gives an introductory generic teaching that the conventional method for preparing trialkylsilyl trifluoroacetamide by the reaction of a trialkylchlorosilane can be performed in a solvent which includes benzene and the aliphatic hydrocarbon hexane. Shinohara is used exclusively to show the generic teaching of what conventional method and solvents for preparing trialkylsilyl trifluoroacetamide were known to one of ordinary skill in the art at the time of the invention. Shinohara shows that the non polar hexane (aliphatic hydrocarbon) can be used and is equivalent to benzene which is the solvent used by Klebe.

Mawhinney et al in a similar process for preparing bis silyl amides teaches that the reaction is performed in the presence of a base whose carbon number is not more than about 10 ( e.g. pyridine, trimethylamine, triethylamine, N-methylmorpholine etc).

It would have been obvious to one ordinary skill to have used the process of Klebe using any known non polar solvent for the process, such as those taught by Shinohara, and using either a perfluoroalkyl acylamide or a non perfluoroacylamide since Mawhinney states that both reagents can be used in the process. The motivation to use a non polar solvent (e.g. benzene, or hexane etc) would be to keep the amine hydrochloride by-product ( which is ionic) from dissolving in the solvent ( like solvents dissolve like compounds and benzene and hexane are non

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ionic and non polar) and thus being able to remove more by filtration and causing the product to be purer since the salt by-product is a contaminant. It is not an unobvious modification to use any known solvent (i.e. change known solvents) for a known process such as Klebe barring unexpected results by the use of the solvent.


7. The examiner notes that the prior art does not anticipate or suggest fluorohydrocarbon solvents or silanes and mixtures thereof for solvents in the instant process.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean F. Vollano whose telephone number is 571-2720648. The examiner can normally be reached on Monday-Thursday 6:30 - 5:00.

9. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann Richter can be reached on 571-272- 0646. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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10. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jean F. Vollano  
Primary Examiner  
Art Unit 1621

March 31, 2004